

Notice of Allowability

Application No.

09/270,768

Examiner

Daniel R. Sellers

Applicant(s)

SIBBALD ET AL.

Art Unit

2615

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 9/18/06.
2. ☒ The allowed claim(s) is/are 1-10 and 13-16.
3. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some* c) ☐ None of the:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
- (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
- 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
- (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|--|---|
| 1. <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 5. <input type="checkbox"/> Notice of Informal Patent Application |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 6. <input type="checkbox"/> Interview Summary (PTO-413),
Paper No./Mail Date _____ |
| 3. <input type="checkbox"/> Information Disclosure Statements (PTO/SB/08),
Paper No./Mail Date _____ | 7. <input type="checkbox"/> Examiner's Amendment/Comment |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit
of Biological Material | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance |
| | 9. <input type="checkbox"/> Other _____ |

DETAILED ACTION

Allowable Subject Matter

1. Claims 1-10 and 13-16 are allowed.
2. The following is an examiner's statement of reasons for allowance:

Regarding **claim 1**, the prior art at the time of the invention fails to teach or suggest a method of processing audio as claimed. Specifically, the prior art does not teach or suggest the feature of augmenting the binaural processing, which uses head related transfer functions (HRTF), with high frequency (HF)-cut filtering, wherein the HF-cut filtering decreases as a given direction approaches the forward hemisphere.

Fujita teaches a method of binaural processing, using HRTF, but it does not teach HF-cut filtering with the above feature. Fujita teaches a method that combines and mixes two signals, wherein one signal is the original and the other signal is a filtered signal filtered with a low-pass, or high-cut, filter (fig. 11). The resultant signal has a mix of the two signals according to the sound image localization direction, or azimuth (fig. 13). The mix does not decrease the amount of filtering, but decreases the level, or volume, of the filtered signal.

Inanaga et al. (hereinafter Inanaga) (USPN 5495534) teach an audio signal reproducing apparatus, wherein binaural processing using HRTF is augmented with low-pass filters (Col. 3, lines 38-62, Col. 5, lines 14-32, Col. 6, lines 5-11, Col. 6, line 59 - Col. 7, line 54, and Fig. 1 and 3). Inanaga teaches the use of low-pass, or HF-cut, filters for removing the high frequency components from the audio signal output by the HRTF filters when the virtual sound source is in the rear hemisphere (Col.7, lines 13-54

Art Unit: 2615

and Fig. 4). However, Inanaga does not teach or suggest settable HF-cut filtering, which is settable according to the given direction of the virtual sound source.

Furthermore, Inanaga does not teach or suggest decreasing the amount of HF-cut filtering, which decreases as a given direction approaches the forward hemisphere, or first and second quadrant (Col. 7, lines 48-54, Col. 11, lines 34-43, and Fig. 1 and 6).

Regarding **claims 2, 4-10, and 16**, these claims are allowed because they depend on an allowable claim.

Regarding **claim 3**, the prior art of record at the time of the invention does not teach or suggest a method of processing audio as claimed. Specifically, the prior art does not teach or suggest the feature of augmenting the binaural processing, which uses head related transfer functions (HRTF), with high frequency (HF)-cut filtering, which is settable according to the given direction of the virtual sound source, and wherein the HF-cut filtering is zero for virtual sound sources placed at directions of azimuth between 0 degrees and plus or minus 90 degrees relative to the preferred position of the listener.

Inanaga, as previously stated with respect to claim 1, does teach zero HF-cut filtering for virtual sounds placed in the front hemisphere. Inanaga teaches a fixed low-pass filter for virtual sound placed in the rear hemisphere (Col. 7, lines 48-54, Col. 11, lines 34-43, and Fig. 1 and 6). However, Inanaga does not teach or suggest settable HF-cut, or low-pass, filtering.

Regarding **claims 13-15**, these claims are allowed for the same reason claim 1 is allowable.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniel R. Sellers whose telephone number is 571-272-7528. The examiner can normally be reached on Monday to Friday, 9am to 5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sinh Tran can be reached on (571)272-7564. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



SINH TRAN
SUPERVISORY PATENT EXAMINER

DRS